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IDAHO DEPARTMENT OF HEALTH & WELFARE

Bureau of Community and Environmental Health

Sulfur Dioxide Fact Sheet

What is it?

Sulfur dioxide (SO_2) is considered a pollution problem worldwide. SO_2 is a colorless gas or liquid with a strong odor, which affects the human respiratory system and aggravates cardiovascular disease. When SO_2 combines with moisture in the atmosphere, it can form sulfuric acid. Sulfuric acid is the main component of acid rain. Acid rain can harm humans, animals, vegetation, and can erode buildings, statues, and other structures.

Where does it come from?

Human beings cause the release of about one-third of all sulfur compounds in the atmosphere. SO_2 is released when fossil fuels are burned (coal, oil, gasoline, and diesel fuel). Most SO_2 is caused by stationary sources such as fertilizer manufacturers, power plants, refineries, wood and paper mills, metal smelters, and other industrial processes.

How can a person be exposed?

Exposure to SO_2 happens when people breathe in SO_2 fumes from the air. Living next to industries that generate SO_2 will greatly raise a person's risk of exposure.

What are the effects of SO_2 on human health?

Healthy people exposed to 1.5 parts per million (ppm) of SO_2 for a few minutes may have temporary difficulty breathing normally. Breathing SO_2 can irritate the nose, throat, and lungs causing coughing and shortness of breath. A brief exposure to higher concentrations of SO_2 (400 ppm) can cause severe shortness of breath and a build-up of fluid in the lungs (pulmonary edema, a medical emergency). SO_2 can go deep into the lungs where it combines with moisture to form sulfuric acid, possibly causing permanent lung damage.

Long term exposure to SO_2 at lower concentrations can cause temporary loss of smell, headache, nausea, and dizziness. SO_2 can irritate the lungs causing phlegm, coughing, shortness of breath, development of bronchitis and other respiratory diseases, as well as aggravation of existing cardiovascular disease. Long term exposure to SO_2 may also decrease fertility in males and females.

Who is most sensitive to SO_2?

Because children breathe in more air for their body weight than adults do, children can be more sensitive to the effects of SO_2 than adults. Long term exposure to SO_2 can change a child's ability to breathe deeply. Increased respiratory illness, wheezing fits, and respiratory related emergency room visits are possible effects of long term exposure to SO_2 for children.

Individuals with asthma, the elderly, and those with cardiovascular or chronic lung disease (bronchitis, emphysema) are also sensitive to the effects of SO_2. In fact, these people may be sensitive to lower concentrations of SO_2 than healthy people.

When may levels of SO_2 be unhealthy?

The Idaho Department of Environmental Quality (IDEQ) announces air quality advisories when levels of pollution could possibly harm human health. These advisories are more common in the winter months when weather inversions occur. During inversions, air pollution is trapped close to the ground and can not escape to the upper atmosphere. The longer the inversion lasts, the more concentrated the pollution becomes potentially reaching unhealthy levels.

How can I protect myself from exposure to unhealthy levels of SO_2?

Listen for air quality advisories from the IDEQ. Local TV news stations, radio stations, and newspapers will carry advisories. You can also visit the IDEQ daily report web site at http://www.deq.state.id.us/air/air1.htm.

When levels of SO_2 are high, avoid moderate exercise and stay indoors. This is especially important for sensitive people. The American College of Sports Medicine defines moderate exercise as any activity level which maintains 55-75% of a person's maximum heart rate. To calculate the heart rate you need to stay below to avoid moderate exercise, subtract your age from 220 and multiply by 0.55 ([220 – age] x 0.55).

For more information:

The Bureau of Community and Environmental Health (BCEH), Idaho Division of Health, works to protect human health from dangerous substances in the environment. This fact sheet has been created to assist you in understanding what effects exposure to SO_2 can have on human health. For further information about the Bureau, hazardous waste sites, and dangerous substances, contact:

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